Special Problem B-3

Find the particular solution for each of the following ODEs. State whether there is a single solution or an infinite number of solutions. Plot the solution (or an example if there are infinitely many) using the numerical tool of your choice (e.g. Python, Excel) and verify that it satisfies the initial/boundary conditions.

(a)
$$\frac{d^2\psi}{dx^2} + \pi^2\psi = 0$$
, $\frac{d\psi}{dx}(0) = 0$, $\frac{d\psi}{dx}(1) = 0$

(b)
$$\frac{d^2x}{dt^2} + \frac{dx}{dt} + \frac{4}{25}x = 0$$
, $x(0) = 1$, $\frac{dx}{dt}(0) = 0$